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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/740,256	12/19/2000	Alan R. Reinberg	MCRO:106--2/FLE	5857

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EXAMINER	
TRAN, THIEN F	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 11/27/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/740,256	Applicant(s) REINBERG ET AL.	
	Examiner Thien F Tran	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 32-76* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,32-36,38,39,41-51,53,54,56-66,68,69 and 71-76* is/are rejected.

7)☒ Claim(s) *37,40,52,55,67 and 70* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Double Patenting

1. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

2. Claim 1 is rejected under 35 U.S.C. 101 as claiming the same invention as that of claim 1 of prior U.S. Patent No. 5,952,671. This is a double patenting rejection.

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 32-34, 41-49 and 56-61 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No.

5,952,671. Although the conflicting claims are not identical, they are not patentably distinct from each other because it is well known that a first electrode, a memory material and a second electrode constitute a memory element; and the memory element and the access device together forming a single memory cell. Therefore, it would have been obvious to one ordinary skill in the art that the memory element operatively coupled to the access device in order to function as a single memory cell. Furthermore, the memory material in U.S. Patent No. 5,952,671 comprises the claimed chalcogenide material, it is obvious that all the functions and characteristics recited in claims 42-43, 45-46, 57-58, 60-61 are inherent characteristics of the memory material in response to electrical stimulus.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buckley (US 3,886,577) in view of Klersy et al. (US 5,536,947).

Buckley discloses a memory cell (Fig. 6) comprising: an access device (28, 30) formed on a semiconductor substrate 2'; a layer 2a' of dielectric material disposed on said access device, said layer of dielectric material having a pore 24 therein; a first layer 4' of conductive material disposed within said pore to form a first electrode; a layer (6', 32) of structure changing material disposed

on said first electrode; and a second layer 8a' of conductive material disposed on said layer of structure changing material to form a second electrode. The current photolithographic limit is about 0.2 um. Buckley does not disclose the pore diameter is smaller than 0.2 um. Klersy et al. discloses a memory cell wherein the pore diameter is as low as 0.01um (col. 17, lines 20-23). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to form the pore diameter of Buckley as small as taught by Klersy et al. in order to lower the energy requirements for electrical switching.

7. Claims 32-33, 38-39, 41-48, 53-54, 56-63, 68-69 and 71-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buckley (US 3,886,577) in view of Klersy et al. (US 5,536,947).

Buckley discloses an X-point memory cell (Fig. 6) comprising: an access device (28, 30); a memory element 1' operatively coupled to the access device, the memory element comprising: dielectric material 2a' having a pore 24 therein; a first electrode 4' disposed within the pore; a memory material (6', 32) disposed over the first electrode; and a second electrode (8a', 8b') disposed over to the memory material. The current photolithographic limit is about 0.2 um. Buckley does not disclose the pore diameter is smaller than 0.2 um. Klersy et al. discloses a memory cell wherein the pore diameter is as low as 0.01um (col. 17, lines 20-23). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to form the pore diameter of Buckley as small as taught by Klersy et al. in order to lower the energy requirements for electrical switching. Buckley further disclose a first conductive line 26 extending

in a first direction; a second conductive line 33 extending in a second direction different than the first direction, the first conductive line and the second conductive line being spaced apart by a portion of a substrate, the second conductive line intersecting the first conductive line in an overlapping manner to form an area of intersection in the portion of the substrate, the access device (diode) wholly disposed in the area of intersection, the access device (diode) being operatively coupled to the first conductive line, the memory element 1' wholly disposed in the area of intersection.

Regarding claims 33, 48 and 63, the access device (30, 28) comprises a diode.

Regarding claims 38, 53 and 68, the second electrode is comprised of a plurality of layers (8a', 8b').

Regarding claims 39, 54 and 69, the second electrode is comprised of a plurality of materials.

Regarding claims 41-46, 56-61 and 71-76, the memory material 6' comprises structure changing material of a chalcogenide material which inherently changes between different states of crystallinity in response to electrical stimulus, wherein each of the different states of crystallinity corresponds to a given resistance level. The chalcogenide material comprises a programmable resistive element that changes between different resistance levels in response to electrical stimulus.

8. Claims 34, 49 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buckley (US 3,886,577) in view of Klersy et al. (US 5,536,947) as applied to claims 32, 47 and 62 above, and further in view of Wang et al. (US 4,616,404).

The modified Buckley as described above discloses p-region 30 disposed adjacent n-region 28 forming a diode. Buckley does not disclose p-region 30 comprising polysilicon and n-region 28 comprising polysilicon. Wang et al. discloses a polysilicon diode comprising a layer of N doped polysilicon and a layer of P doped polysilicon. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to form the p-region 30 of polysilicon and the n-region 28 of polysilicon to form a polysilicon diode with low reverse current leakage and low series resistance permitting high current flow.

9. Claims 35-36, 50-51, 65-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buckley (US 3,886,577) in view of Klersy et al. (US 5,536,947) as applied to claims 32, 47 and 62 above, and further in view of Ovshinsky et al. (US 5,414,271).

The modified Buckley as described above does not disclose the first electrode 4' comprised of a plurality of layers and a plurality of materials. Ovshinsky et al. discloses the first electrode comprising two layers (32 and 34) of different of materials (carbon and molybdenum). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to form the first electrode 4' of the modified Buckley comprising two layers of the materials as taught by Ovshinsky et al. in order to form excellent electrical contacts with the memory material 6'.

Allowable Subject Matter

10. Claims 37, 40, 52, 55, 67 and 70 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Thien Tran** whose telephone number is (703) 308-4108. The examiner can normally be reached on Monday through Friday from 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Tom Thomas**, can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Tom Thomas

TOM THOMAS
SUPERVISORY PATENT EXAMINER
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November 13, 2001